



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,255	09/26/2003	James W. Barnwell	87245.1640	4941

7590 12/27/2004

BAKER & HOSTETLER LLP  
Suite 1100  
Washington Square  
1050 Connecticut Avenue, N.W.  
WASHINGTON, DC 20036

EXAMINER

LEUNG, RICHARD L

ART UNIT	PAPER NUMBER
----------	--------------

3744

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/670,255	BARNWELL, JAMES W.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Richard L. Leung	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4, 5, 13, 14, 22, and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 4, 13, and 22 recite the limitation "wherein the condensate separator..." in the first lines of the claims. There is insufficient antecedent basis for this limitation in the claims. None of these claims, nor their parent claims, previously recite a condensate separator. For the purpose of advancing prosecution in this action, claims 4, 13, and 22 will be treated as being dependent from claims 3, 12, and 21 respectively. However, appropriate correction is still required in order to overcome this rejection.
4. Claims 5, 14, and 23 recite the limitation "wherein the wire mesh..." in the first lines of the claims. There is insufficient antecedent basis for this limitation in the claim. None of these claims, nor their parent claims, previously recite a wire mesh. For the purpose of advancing prosecution in this action, claims 5, 14, and 23 will be treated as being dependent from claims 4, 13, and 22 respectively. However, appropriate correction is still required in order to overcome this rejection.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 3744

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 6, 8-12, 15, 17-21, 24, 26, and 27 are rejected under 35

U.S.C. 102(b) as being anticipated by US 5228504 (Mantegazza et al.). Mantegazza et al. disclose a system for drying compressed air (column 1, lines 17-40) comprising a refrigeration means having a compressor I, condenser L, etc. and a heat exchanger means comprising a phase change material G that changes from solid to liquid and from liquid to solid, wherein the refrigeration means is adapted for cooling the heat exchanger. See particularly Fig. 3 and description in column 3, lines 7-31. The heat exchanger further comprises an air-to-air exchanger and an air-to-refrigerant exchanger through fins H, and the air-to-refrigerant exchanger comprises the phase change material G, as best understood. The system additionally has a condensate separator E.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4, 5, 13, 14, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5228504 (Mantegazza et al.) in view of US 6085529 (Galus et al.). As discussed above, Mantegazza et al. disclose all the limitations of the claims except for having the condensate separator further comprise a wire mesh, particularly a wire mesh comprising stainless steel, copper, or plastic. Galus et al. teach an air drying

Art Unit: 3744

system comprising a heat exchanger having an air-to-air heat exchanger 12' and an air-to-refrigerant heat exchanger 14', and further comprising a stainless steel wire mesh 340 used to provide removal of moisture droplets suspended in the air flow. See Fig. 11 and column 17, lines 7-14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the condensate separator in the system disclosed by Mantegazza et al. with a stainless steel mesh as taught by Galus et al. in order to demist the air and remove any suspended moisture entrained in the air.

9. Claims 7, 16, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5228504 (Mantegazza et al.) in view of US 6393861 B1 (Levenduski et al.). As discussed above, Mantegazza et al. disclose all the limitations of the claims except for using organic paraffin as the phase change material. The use of paraffin as a phase change material is old and known in the art, an example of which is demonstrated by Levenduski et al. Levenduski et al. teach a system wherein a refrigeration system is provided with a thermal storage unit 132 having a phase change thermal storage material, and Levenduski et al. further teach that a suitable thermal storage material is organic paraffin. See particularly column 5, lines 55-63. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used organic paraffin as taught by Levenduski et al. as the phase change material in the system disclosed by Mantegazza et al. because such a material has a relatively low cost, is widely available, and is commonly used in the art for thermal storage applications.

**Conclusion**

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2237332 (Bretzlaff et al.): discloses an air conditioning and drying method and means comprising a chill tank containing a heat absorbing medium.

US 3050954 (Royse): discloses an apparatus for condensing and separating moisture from air.

US 3997303 (Newton): discloses a liquid-gas phase separator comprising a wire mesh.

US 4638852 (Basseen et al.): discloses a dehumidification system comprising an air-air heat exchanger and an air-refrigerant heat exchanger.

US 5107919 (Basseen et al.): discloses an air dryer comprising a air-to-air heat exchanger and an air-to-refrigerant heat exchanger.

US 5299633 (Bruggemann et al.): discloses a heat exchanger for refrigeration driers comprising an air-air heat exchanger and an air-refrigerant heat exchanger.

US 5372011 (O'Neal): discloses a system for controlling temperature and humidity of air comprising the use of paraffin as a thermal storage medium.

US 5794453 (Barnwell): discloses a gas drying system comprising a refrigeration system and separator.

US 6311502 B1 (Trombin et al.): discloses a drying system for compressed air comprising an air-to-refrigerant heat exchanger immersed in a thermal accumulating liquid.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise L. Esquivel can be reached on 571-272-4808. The fax phone


Art Unit: 3744

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard L. Leung  
Examiner  
Art Unit 3744

rl

  
DENISE L. ESQUIVEL  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700